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| APPLICATION NO.                                                            | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.           | CONFIRMATION NO. |
|----------------------------------------------------------------------------|-------------|----------------------|-------------------------------|------------------|
| 09/869,802                                                                 | 09/24/2001  | Jan Loncke           |                               | 8899             |
| 22428                                                                      | 7590        | 05/17/2004           |                               |                  |
| FOLEY AND LARDNER<br>SUITE 500<br>3000 K STREET NW<br>WASHINGTON, DC 20007 |             |                      | EXAMINER<br>SAVAGE, MATTHEW O |                  |
|                                                                            |             |                      | ART UNIT<br>1723              | PAPER NUMBER     |

DATE MAILED: 05/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                                      |                                      |  |
|------------------------------|--------------------------------------|--------------------------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>09/869,802 | <b>Applicant(s)</b><br>LONCKE ET AL. |  |
|                              | <b>Examiner</b><br>Matthew O Savage  | <b>Art Unit</b><br>1723              |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 April 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3-13,15,17 and 18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-12 is/are rejected.
- 7) ☒ Claim(s) 13,15,17 and 18 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |                                                                                                                        |                                                                                         |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                                                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____                                                |

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Ishibe.

With respect to claim 1, Ishibe discloses a layered filtering structure (see FIG. 2) having a side capable of functioning as an inlet side and a side capable of functioning as an outlet side since both layers are part of a sintered self supporting structure, the layered structure including a first layer 2 on a second layer 3, each layer including a web of metal fibers which has been sintered (see lines 35-36 of page 5 and lines 33-38 of page 8), the two layers being in contact with each other, the first layer 2 closest to the filter inlet side having a porosity below 55% (e.g., 40-50%, see lines 31-34 of page 5) and the second layer 3 closest to the filter outlet side having a porosity of at least 80% (see lines 56-58 of page 6) and which is at least 20% greater than the porosity of the first layer.

Regarding claim 4, Ishibe discloses the first layer as having the same density since the layer has the same porosity as recited in claim 1 and is formed of stainless steel.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3, and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishibe.

With respect to claim 1, Ishibe discloses a layered filtering structure (see FIG. 2) having an inlet side and an outlet side, the layered structure including a first layer 3 on a second layer 2, each layer including a web of metal fibers which has been sintered (see lines 35-36 of page 5 and lines 33-38 of page 8), the two layers being in contact with each other, the first layer 3 closest to the filter inlet side having a porosity below 55% (see lines 56-58 of page 6). Ishibe fails to specify the second layer 2 closest to the filter outlet side having a porosity of at least 80% and which is at least 20% greater than the porosity of the first layer. Ishibe discloses setting the porosity of the first layer 3 to 50-80%, or greater than 50% to reduce the pressure loss across the filter. It would have been obvious to one skilled in the art at the time the invention was made to increase the porosity of the second layer 2 to 80% or greater in order to reduce the pressure drop across the filter in cases where a lower pore size was desired for the first layer since Ishibe discloses reducing the pressure loss across the first layer by increasing the porosity of the first layer.

As to claim 3, Ishibe discloses the first layer 3 as including metal fibers with a diameter less than 3 microns (see lines 14-16 of page 6), and the second layer 2 as having metal fibers with a diameter of at least three times the diameter of the fibers in the first layer (see lines 15-

Regarding claim 4, Ishibe discloses the first layer as having the same density since the layer has the same porosity as recited in claim 1 and is formed of stainless steel.

Claims 5, and 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishibe in view of DeBruyne et al.

With respect to claim 5, Ishibe fails to specify the first layer 2 as having one even surface. DeBruyne et al discloses that it is known to produce compacted webs having one even surface formed by cold isostatic pressing (see FIGS. 3 and 4) and suggests that such webs have improved filtering characteristics (see lines 28-36 of col. 3). It would have been obvious to have modified the filter of Ishibe et al so as to have included one even surface formed by cold isostatic pressing as DeBruyne et al in order to provide a first layer having better filtering characteristics.

As to claim 9, Ishibe fails to specify the first layer as being obtained by a cold isostatic pressing operation. DeBruyne et al discloses of obtaining the first layer by a cold isostatic pressing operation and suggests that such a procedure improves the homogeneity of the web thereby leading to better filtering characteristics (see lines 28-36 of col. 3). It would have been obvious to have modified the method of Ishibe et al so

as to have included a first layer obtained by cold isostatic pressing as suggested DeBruyne et al in order to provide a first layer having better filtering characteristics.

With respect to claim 10, Ishibe discloses a method of manufacturing a layered filtering structure including the steps of sintering a web of metal fibers to form a first layer 3 and compacting the first layer to a porosity below 55% (see lines 35-36 of page 5), providing a web of metal fibers to form a second layer 2, bringing the first compacted layer and the second layer into contact with each other to form a layered assembly (see lines 5-8 of page 8), and sintering the layered assembly to form a coherent entity (see lines 33-38 of page 8) wherein the second layer has a porosity which is at least 20% greater than the porosity of the first layer (see lines 56-58 of page 6, lines 31-34 of page 5. Ishibe fails to specify compacting the web after sintering the web as suggested in the claim and as disclosed in the instant specification. DeBruyne et al discloses the concept of compacting a web by a cold isostatic pressing operation after sintering the web (see Test 2 in col. 6) and suggests that such a procedure improves the homogeneity of the web thereby leading to better filtering characteristics (see lines 28-36 of col. 3). It would have been obvious to have modified the method of Ishibe et al so as to have included the steps of compacting the web by cold isostatic pressing after sintering the web as suggested DeBruyne et al in order to provide a first layer having better filtering characteristics.

Regarding claim 11, DeBruyne et al disclose compacting by a cold isostatic pressing operation.

Concerning claim 12, Ishibe discloses the second layer 3 as having a porosity of at least 80% (see lines 56-58 of page 4).

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ishibe in view of Fisher.

With respect to claim 6, Ishibe fails to specify a wire net that is fixed to the first layer or the second layer. Fisher discloses fixing a wire net 4,6 to inlet and outlet sides of an analogous filtering structure and suggests that such an arrangement increases the tensile strength of the filter (see lines 36-52 of col. 3). It would have been obvious to have modified the filter of Ishibe so as to have included a wire net fixed to the inlet and outlet sides of the filter in order to increase the tensile strength of the filter.

As to claim 7, Ishibe fails to specify first and second wire nets 4, 6 located at inlet and outlet sides of an analogous filter. Fisher discloses fixing first and second wire nets to inlet and outlet sides of an analogous filtering structure and suggests that such an arrangement increases the tensile strength of the filter (see lines 36-52 of col. 3). It would have been obvious to have modified the filter of Ishibe so as to have included a first and second wire nets fixed to the inlet and outlet sides of the filter in order to increase the tensile strength of the filter. Fisher fails to specify the first wire net as having meshes and a diameter that is smaller than the meshes and diameter of the second wire net. Ishibe generally teaches increasing the porosity and diameter of the filter material in a direction of flow through the filter and suggests that such an arrangement provides a filter structure with a low pressure loss and that is self

supporting. It would have been obvious to have modified the combination suggested by Ishibe and Fisher so as to have included a first wire net as having meshes and a diameter smaller than meshes and diameter of a second wire net in order to further reduce the pressure drop across the filter and to provide a filter structure that was self supporting.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ishibe in view of Fisher as applied to claim 7 above, and further in view of Roberts.

Ishibe and Fisher fail to specify wire nets that are calendered. Fisher discloses the concept of providing a calendered wire net 1 and suggests that such a configuration increases an area of contact between the net and an adjacent filtering structure thereby improving a metallurgical bond therebetween (see lines 26-36 of col. 2). It would have been obvious to have modified the combination suggested by Ishibe and Fisher so as to have included a calendered wire net as suggested by Roberts in order to increase an area of contact with the inlet or outlet sides of the filter thereby improving a metallurgical bond therebetween.

Claims 13, 15, 17, and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The rejection of claims 14 and 16 under 35 U.S.C. 112, first paragraph have been obviated by applicant's cancellation of those claims



Applicant's arguments filed 3-18-04 have been fully considered but they are not persuasive.

Applicant argues that the second layer of short metal fibers disclosed by Ishibe is not a web. A web can be broadly defined as a portion of material having length and width each greater than its thickness (see the class 428 definition of the term "web" in the USPTO Manual of Patent classification). Accordingly, the second layer constitutes a web since it has width and length dimensions that are greater than its thickness.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew O Savage whose telephone number is (571) 272-1146. The examiner can normally be reached on Monday-Friday, 6:00am-2:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda W. Walker can be reached on (571) 272-1151. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 1723

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

*Matthew O. Savage*  
Matthew O Savage  
Primary Examiner  
Art Unit 1723

mos  
May 13, 2004